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FILING DATE: *April 01, 2004*
RELATED PCT APPLICATION NUMBER: *PCT/US05/08744*

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Attorney's Matter No. 1342-68322
PATENT

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PROVISIONAL APPLICATION COVER SHEET

This is a request for filing a PROVISIONAL APPLICATION FOR PATENT under 37 C.F.R. § 1.53(c).

TITLE: RETAINING WALL SYSTEM

Inventor(s)/Applicant(s):

Hammer	James		Fircrest, Washington
Last	First	MI	City, State or Foreign Country and City

☒ 4 pages of specification are enclosed.

☒ 2 sheet(s) of drawings are enclosed..

☒ Provisional Filing Fee Amount:
☒ $ 160.00, large entity

☒ A check in the amount of $160.00 to cover the filing fee is enclosed.

☒ The Director is hereby authorized to charge any additional fees which may be required in connection with the filing of this provisional application and recording any assignment filed herewith, or credit over-payment, to Account No. 02-4550. A copy of this sheet is enclosed.

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RETAINING WALL SYSTEM

The present invention concerns a system for constructing retaining walls from courses of retaining wall blocks, and more particularly to such walls that better resist outward horizontal forces exerted by retained earth.

A retaining wall according to one embodiment comprises multiple, vertically stacked courses of retaining wall blocks, such as the blocks disclosed in U.S. Patent Nos. 5,350,256 and 5,688,078, which are incorporated herein by reference. The wall includes a concrete footing that is interconnected with the first course of blocks to assist in resisting against horizontal sliding forces at the base of the wall.

FIGS. 1-4 illustrate one approach for constructing the wall. As shown, a trench 10 is excavated at the bottom of an embankment where the first course of the retaining wall is to be formed. The depth of the trench depends on the particular installation. Generally, increasing the depth increases the ability of the wall to resist against sliding forces. As shown in FIG. 2, a front void or step 20 can be formed in front of the trench 10 and a back void or step 22 can be formed in back of the trench 10.

After the trench is formed, the first course of blocks is formed by positioning a plurality of block assemblies 12 side-by-side along the length of the trench 10. Each block assembly 12 in the illustrated embodiment includes a face block 14 at the front of the wall, an anchor block 16 at the back of the wall, and a trunk block 18 interconnecting the face block and the anchor block. As best shown in FIG. 1, the face block 14 can be positioned in front of the trench 10, the anchor block 16 can be positioned in back of the trench 10, and the trunk block 18 can be positioned to extend above the trench 10. As shown in FIG. 2, an optional elevation pad 24 can be positioned in the front void 20 underneath the face block 14 and an optional elevation pad 26 can be

positioned in the back void 22 underneath the anchor block 16. Elevating the block assemblies in this manner helps concrete flow under and around the trunk blocks 18. The connections between the separate block components of each block assembly 12 are such that the trunk block 18 can be suspended by the face block and the anchor block above the trench 10. Optional forms (e.g., wooden 2x4's) can positioned in the front void and the back void under the face blocks 14 and the anchor blocks 16.

After the first course of blocks is formed, concrete is poured into the trench and the space between adjacent block assemblies 12 to a height at or below the top surface of the block assemblies 12 (e.g., 2" below the top surface of the block assemblies) to form a concrete footing 30, as illustrated in FIGS. 3 and 4. Re-bars 28 can be inserted into the uncured concrete for structural reinforcement. As can be appreciated, the face blocks 14 and the anchor blocks 16 serve as a formwork for retaining concrete poured between the block assemblies 12. Additional courses can then be formed over the first course, such as described in the '256 and the '078 patents. The concrete footing 30 helps stabilize the first course of blocks and assists the blocks in resisting horizontal forces exerted by retained earth at the base of the wall.

Another approach for forming the retaining wall is illustrated in FIGS. 5-10. In this approach, prior to installing the first course of blocks, concrete is poured into the trench 10 to the level of the front and back voids 20, 22, and re-bar 28 can be placed in the uncured concrete (as shown in FIG. 6). After the concrete cures, a keyway 32 can be formed at the top of the concrete slab along the length of the trench and fill material, such as aggregate or sand, is used to fill the front and back voids (FIG. 8). The first course of blocks is then formed by positioning the face blocks 14 on the fill material in the front void and the anchor blocks on the fill material in the back void. After laying the first course of blocks, concrete is poured between the block

assemblies to a height at or below the top surface of the block assemblies. When the second concrete pour has cured, additional courses can be formed over the first course of blocks.

I CLAIM:

1. A retaining wall comprising:

a first course of retaining wall blocks and at least a second course of retaining wall blocks formed above the first course, wherein each course defines a plurality of spaces between adjacent retaining wall blocks; and

a concrete footing formed in a trench below the first course of blocks and the spaces between the blocks in the first course.

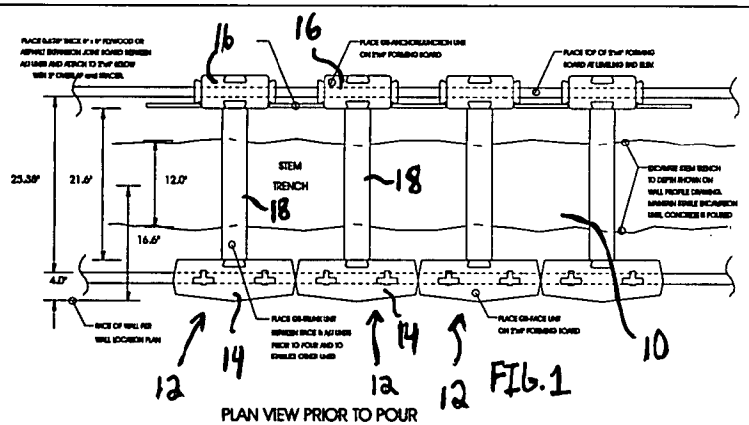
2. The retaining wall of claim 1, wherein the blocks of the first course are connected to the blocks of the second course by a mortarless connection.

3. A method for constructing a retaining wall, the method comprising:

forming a trench in the ground;

forming a first course of blocks above the trench; and

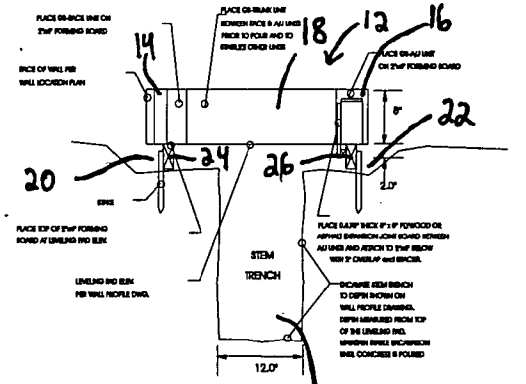
forming a concrete footing in the trench and between the blocks.



PLAN VIEW PRIOR TO POUR

SLIDE STOP: ONE POUR TECHNIQUE

FIG. 1



SECTION VIEW PRIOR TO POUR

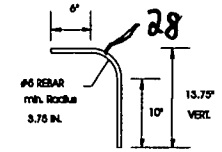
SLIDE STOP: ONE POUR TECHNIQUE

FIG. 2

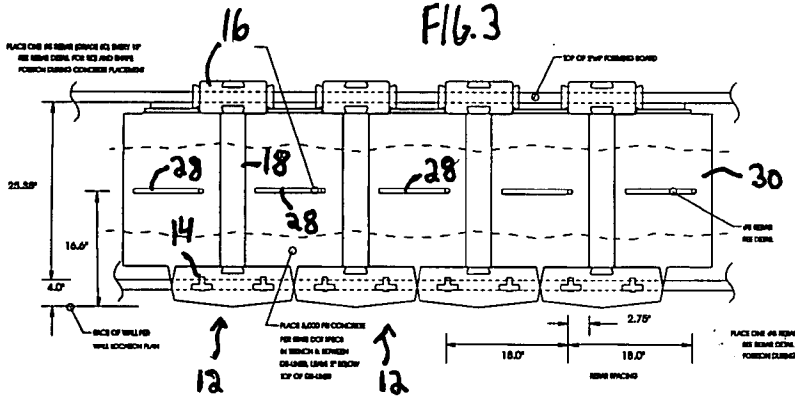
SLIDE STOP IMPROVEMENT TO SLIDING RESISTANCE

Phi SOIL STRENGTH	INCREASED HORIZONTAL SLIDING RESISTANCE from 12" wide SLIDE STOP beneath GS walls				
	12 in. STEM DEPTH	18 in. STEM DEPTH	24 in. STEM DEPTH	30 in. STEM DEPTH	36 in. STEM DEPTH
degs.	lbst/ft.	lbst/ft.	lbst/ft.	lbst/ft.	lbst/ft.
24	73	204	399	660	986
26	79	220	432	714	1,067
28	86	238	467	771	1,152
30	93	258	506	836	1,249
32	101	280	549	907	1,355
34	109	304	596	984	1,470
36	119	331	648	1,071	1,600
38	130	361	708	1,170	1,748
40	143	396	776	1,283	1,917
42	156	434	851	1,406	2,101

1. STEM (TRENCH) TO BE EXCAVATED TO DEPTH WITH VERTICAL SIDES
   TRENCH EXCAVATION SHALL BE STABLE UNTIL CONCRETE IS POURED.
   TRENCH DEPTH TOLERANCE 1.5 IN.; EXCAVATED SOIL MIN. 110 PCF.
2. ONE #5 REBAR EVERY 18 IN.; MEETING ASTM A615 - Grade 60
3. CONCRETE: MINIMUM 3,000 PSI COMPRESSIVE STRENGTH (28 DAYS)



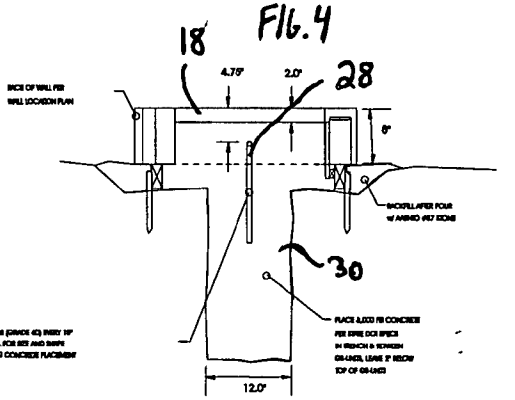
REBAR DETAIL



PLAN VIEW AFTER CONCRETE POUR

SLIDE STOP: ONE POUR TECHNIQUE

FIG. 3



SECTION VIEW AFTER CONCRETE POUR

SLIDE STOP: ONE POUR TECHNIQUE

FIG. 4

ONE POUR SPECIFICATION

1. SURVEY IN WALL ALIGNMENT & ELEVATION TO LOCATE TRENCH POSITION. EXCAVATE STEM TRENCH TO SPECIFIED DEPTH WITH VERTICAL SIDES, TO MIN. 12 IN. WIDTH. KEEP EXCAVATION STABLE UNTIL CONCRETE IS POURED. TRENCH DEPTH TOLERANCE 1.5". EXCAVATED SOIL TO BE MIN. 110 PCF.
2. SET SUPPORT FORMS FOR GRAVITYSTONE FACE & ANCHOR/JUNCTION UNITS ON THE PROPOSED WALL ALIGNMENT & LEVELING PAD ELEVATION. WEDGE PLYWOOD OR EXP. JOINT BOARD BETWEEN GAPS OF AU UNITS
3. CONCRETE: MINIMUM 3,000 PSI COMPRESSIVE STRENGTH (28 DAYS) PLACE CONCRETE ACCORDING TO STATE DOT STANDARDS FOR WEATHER, TEMPERATURE, SLUMP, VIBRATION, TOLERANCES, & FINISH. EXP. JOINTS REQUIRED ONLY AT LEVELING PAD ELEVATION CHANGES. LEAVE CONCRETE SURFACE 2" BELOW TOP OF GRAVITYSTONE BLOCKS.
4. PLACE 1 #5 Grade 60 (ASTM A615) REBAR EVERY 18 IN. HORIZ. REBAR BENT COLD, MIN. 3.75" RADIUS BETWEEN 10" VERTICAL AND 6" HORIZONTAL LENGTHS. MIN. 2.5" CONCRETE COVER ALL SIDES.
5. CLEAN CONCRETE SPLATTER OFF THE TOPS OF GRAVITYSTONE FACE AND AU UNITS BEFORE INITIAL SET, OR PROTECT THEM BEFORE POUR.
6. STANDARD GRAVITYSTONE CONSTRUCTION MAY CONTINUE AFTER WAITING A MIN. 24 HOURS FOR CONCRETE TO CURE
7. BACKFILL BENEATH THE GS-FACE and GS-ANCHOR/JUNCTION UNITS WITH COARSE AGGREGATE (#57 Stone) BEFORE PLACING ANY OTHER GS UNITS.

Inventor (s): James Hammer
Express Mail No. EV 339210330US / Deposit Date April 1, 2004
Title: RETAINING WALL SYSTEM (Provisional)
Attorney's Matter No.: 1342-68322
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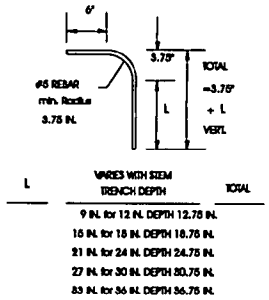

REBAR DETAIL

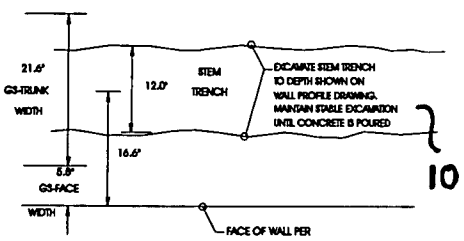

Fig. 7

PLAN VIEW PRIOR TO FIRST POUR

SLIDE STOP: DOUBLE POUR METHOD

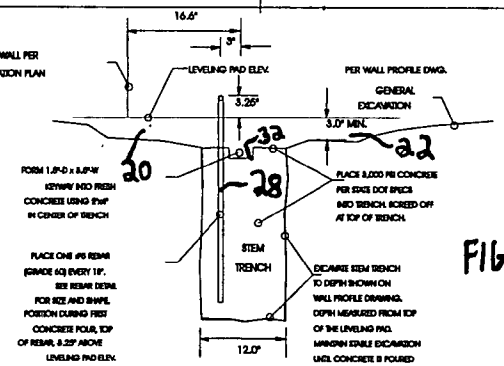

Fig. 6

SECTION VIEW AFTER FIRST CONCRETE POUR

SLIDE STOP: DOUBLE POUR METHOD

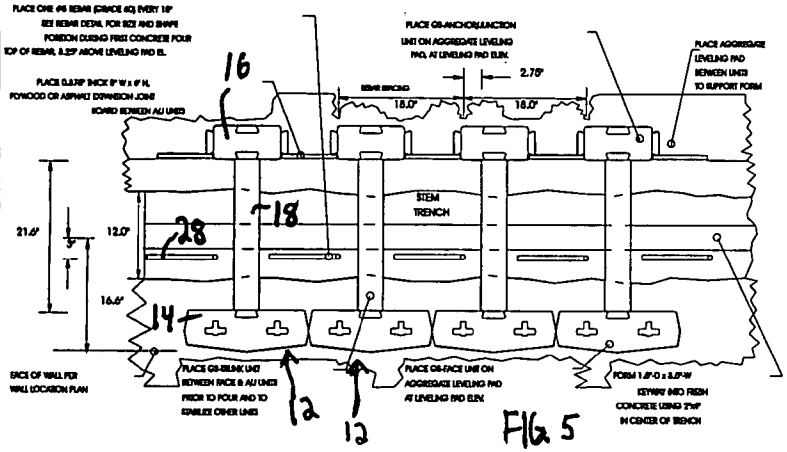

Fig. 5

PLAN VIEW PRIOR TO SECOND CONCRETE POUR

SLIDE STOP: DOUBLE POUR METHOD

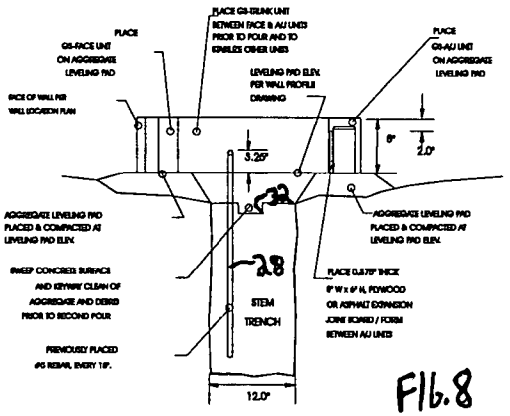

Fig. 8

SECTION VIEW PRIOR TO SECOND POUR

SLIDE STOP: DOUBLE POUR METHOD

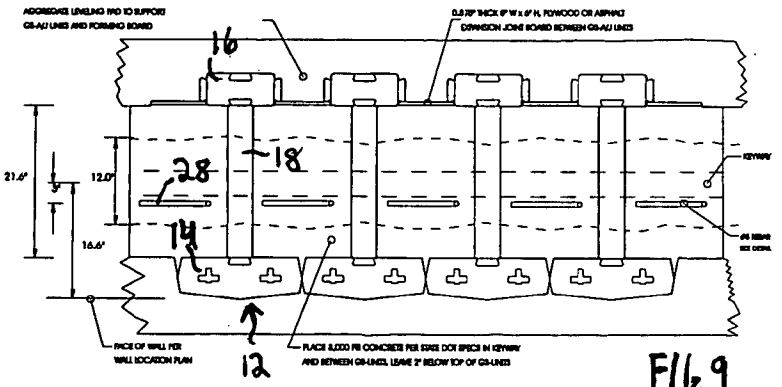

Fig. 9

PLAN VIEW AFTER SECOND CONCRETE POUR

SLIDE STOP: DOUBLE POUR METHOD

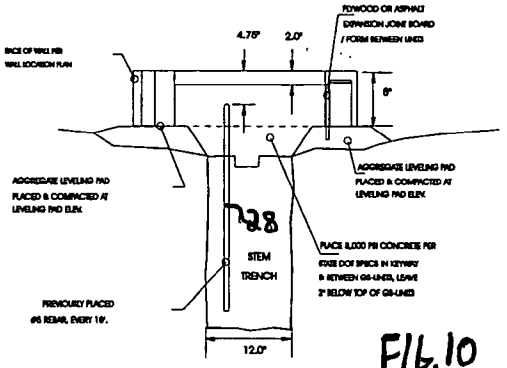

Fig. 10

SECTION VIEW AFTER SECOND POUR

SLIDE STOP: DOUBLE POUR METHOD

SLIDE STOP IMPROVEMENT TO SLIDING RESISTANCE

Phi SOIL STRENGTH	INCREASED HORIZONTAL SLIDING RESISTANCE from 12" wide SLIDE STOP beneath GS walls				
	12 in. STEM DEPTH	18 in. STEM DEPTH	24 in. STEM DEPTH	30 in. STEM DEPTH	36 in. STEM DEPTH
degs.	lbs/ft.	lbs/ft.	lbs/ft.	lbs/ft.	lbs/ft.
24	73	204	399	660	986
26	79	220	432	714	1,067
28	86	238	467	771	1,152
30	93	258	506	836	1,249
32	101	280	549	907	1,355
34	109	304	595	984	1,470
36	119	331	648	1,071	1,600
38	130	361	708	1,170	1,748
40	143	396	776	1,283	1,917
42	156	434	851	1,406	2,101

1. STEM (TRENCH) TO BE EXCAVATED TO DEPTH WITH VERTICAL SIDES
   TRENCH EXCAVATION SHALL BE STABLE UNTIL CONCRETE IS POURED.
   TRENCH DEPTH TOLERANCE 1.5 IN.; EXCAVATED SOIL MIN. 110 PCF.
2. ONE #6 REBAR EVERY 18 IN.; MEETING ASTM A615 - Grade 60
3. CONCRETE: MINIMUM 3,000 PSI COMPRESSIVE STRENGTH (28 DAYS)

DOUBLE POUR SPECIFICATIOI

1. SURVEY IN WALL ALIGNMENT & ELEVATION TO LOCATE TRENCH POSITION.
   PROOF-ROLL (COMPACT) SITE SOILS IN THE ENTIRE FOUNDATION BEARING AT A DEPTH OF 3 IN BELOW LEVELING PAD ELEV. TO 95% STD. PROCTOR.
   EXCAVATE STEM TRENCH TO SPECIFIED DEPTH WITH VERTICAL SIDES, TO MIN. 12 IN. WIDTH. KEEP EXCAVATION STABLE UNTIL CONCRETE IS POURED.
   TRENCH DEPTH TOLERANCE 1.5". EXCAVATED SOIL TO BE MIN. 110 PCF.
2. CONCRETE: MINIMUM 3,000 PSI COMPRESSIVE STRENGTH (28 DAYS)
   FIRST CONCRETE POUR INTO TRENCH ONLY, PER STATE DOT STANDARDS FOR WEATHER, TEMPERATURE, SLUMP, VIBRATION, TOLERANCES, & FINISH.
   EXP. JOINTS NOT REQUIRED. PLACE REBAR AND FORM KEYWAY WITH 2"x4" WHILE CONCRETE IS WET ACCORDING TO SECTION DETAILS.
3. PLACE 1 #5 Grade 60 (ASTM A615) REBAR EVERY 18 IN. HORIZ.
   REBAR BENT COLD, MIN. 3.75" RADIUS BETWEEN 10" VERTICAL AND 6" HORIZONTAL LENGTHS. TOP OF REBAR 3.25" ABOVE LEVELING PAD ELEV.
4. PLACE #67 STONE or ABC LEVELING PAD MATERIAL TO SUPPORT THE GS-FACE and GS-ANCHOR/JUNCTION UNITS ON THE PROPOSED WALL ALIGNMENT & LEVELING PAD ELEV. PLACE GS-TRUNK UNITS OVER TRENCH.
   WEDGE PLYWOOD OR EXP. JOINT BOARD BETWEEN GAPS OF AJ UNITS
5. CONCRETE: MINIMUM 3,000 PSI COMPRESSIVE STRENGTH (28 DAYS)
   SECOND CONCRETE POUR INTO TRENCH and BETWEEN GS-UNITS PER STATE DOT STANDARDS FOR PLACEMENT and FINISH.
   LEAVE CONCRETE SURFACE 2" BELOW TOP OF GRAVITYSTONE BLOCKS.
6. CLEAN CONCRETE SPLATTER OFF THE TOPS OF GRAVITYSTONE FACE AND AJ UNITS BEFORE INITIAL SET, OR PROTECT THEM BEFORE POUR.
7. STANDARD GRAVITYSTONE CONSTRUCTION MAY CONTINUE AFTER WAITING A MIN. 24 HOURS FOR CONCRETE TO CURE